

JOURNAL OF MOLECULAR SPECTROSCOPY

JMOSA 3

VOLUME 57, 1975

Editor

K. Narahari Rao

Editorial Advisory Board

D. L. Albritton

G. Amat

Børge Bak

Frank C. De Lucia

David M. Dennison

David A. Dows

Robert W. Field

Hs. H. Günthard

G. Herzberg

Jon T. Hougen

K. K. Innes

Richard C. Lord

Ross A. McFarlane

Arthur Maki

A. Mangini

Anthony J. Merer

Ian Mills

Yonezo Morino

Robert S. Mulliken

Takeshi Oka

J. Plíva

M. B. Robin

James K. G. Watson

H. L. Welsh

E. Bright Wilson, Jr.

Manfred Winnewisser

R. N. Zare



ACADEMIC PRESS
NEW YORK and LONDON

A Subsidiary of Harcourt Brace Jovanovich, Publishers

Copyright © 1975 by Academic Press, Inc.

ALL RIGHTS RESERVED

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

MADE IN THE UNITED STATES OF AMERICA

CONTENTS OF VOLUME 57

NUMBER 1, JULY 1975

J. MICHAEL FINLAN AND GARY SIMONS. Capabilities and Limitations of an Analytic Potential Expansion for Diatomic Molecules.	1
RICHARD A. TEICHMAN III AND EUGENE R. NIXON. The $A \rightarrow X$ Emission Spectra of PbS and PbSe in Neon Matrices: Enhanced Emission from Isotopes and Matrix Sites.	14
JOHN W. BIRKS, STEVEN D. GABELNICK, AND HAROLD S. JOHNSTON. Chemiluminescence of IF in the Gas Phase Reaction of I_2 with F_2 .	23
D. SCHWOCH AND H. D. RUDOLPH. The Microwave Spectra of Ortho-Fluorotoluene with the Asymmetric Internal Rotors CH_3D and CD_3H .	47
M. TESIC AND YOH-HAN PAO. Theoretical Assignment of the Observed Hyperfine Structure in the Saturated Absorption Spectra of I_2^{129} and $I^{127}I^{129}$ Vapors in the 633 nm Wavelength Region.	75
R. R. FILGUEIRA, P. FORTI, AND G. CORBELLI. Microwave Spectrum and Molecular Force Field of Tetratomic C_{2v} Molecules: NO_2CL .	97
ROBERT W. FIELD, DAVID O. HARRIS, AND TAKEHIKO TANAKA. Continuous Wave Dye Laser Excitation Spectroscopy $CaF A^2\Pi_r - X^2\Sigma^+$.	107
R. WELLINGTON DAVIS AND M. C. L. GERRY. The Microwave Spectrum, Structure, and Dipole Moment of Propiolyl Fluoride.	118
K. I. DISMUKE, W. R. M. GRAHAM, AND W. WELTNER, JR. Optical and ESR Spectra of the C_4H Radical in Rare Gas Matrices at 4 K.	127
R. GARY LEE, ROBERT H. HUNT, EARLE K. PLYLER, AND DAVID M. DENNISON. A High-Resolution Study of the OH-Stretch Fundamental of Methanol	138
NOTES	
A. W. MANTZ, J.-P. MAILLARD, WON B. ROTH, AND K. NARAHARI RAO. Ground State Molecular Constants of $^{12}C^{14}O$.	155
JOEL TELLINGHUISEN AND D. L. ALBRITTON. Equivalent Methods of Calculating Diatomic Centrifugal Distortion Constants.	160
P. ADAMEK. Total Energy Distribution Method for Classification of Normal Modes of Vibration: A Comment.	164
A. C. VENKATACHAR AND J. A. ROBERTS. Microwave Collision Diameters for Q-Branch Transitions in Monomeric Formaldehyde.	166

NUMBER 2, AUGUST 1975

J. R. DURIG, P. J. COOPER, AND Y. S. LI. Spectra and Structure of Organogermanes. Microwave and Raman Spectra of Methyltrichlorogermane.	169
R. W. KITCHIN, THOMAS B. MALLOY, JR., AND ROBERT L. COOK. The Molecular Conformation and Dipole Moment of Thiane From the Microwave Spectrum.	179

CONTENTS

A. J. CARELESS AND H. W. KROTO. Rotational Transitions in Degenerate Vibrational States of C_3 , Symmetric Top Molecules, with Application to $CH_3C^{15}N$.	189
A. J. CARELESS AND H. W. KROTO. Analysis of the Microwave Rotation Spectrum of Silyl Cyanide, SiH_3CN , in Its Ground and Vibrationally Excited States.	198
J. C. D. BRAND, J. L. HARDWICK, AND K.-E. TEO. Laser-Excited Fluorescence of $CSCl_2$.	215
ROWLAND J. HAYWARD AND BRYAN R. HENRY. A General Local-Mode Theory for High Energy Polyatomic Overtone Spectra and Application to Dichloromethane.	221
ROBERT A. TOTH AND JACK S. MARGOLIS. Spectrum of $H_2^{18}O$ in the 2900 to 3400 cm^{-1} Region.	236
G. TARRAGO, M. DANG-NHU, G. POUSSIGUE, G. GUELACHVILI, AND C. AMIOT. The Ground State of Methane $^{12}CH_4$ through the Forbidden Lines of the ν_3 Band.	246
A. M. MIRRI, F. SCAPPINI, AND H. MÄDER. Stark Effect in the Torsio-Rotational Spectrum of Propargyl Mercaptan and SH Bond Moment Determination.	264
M. L. GINTER, S. G. TILFORD, AND A. M. BASS. Electronic Spectra and Structure of the Hydrogen Halides. States Associated with the $(\sigma^2\pi^3)$ σ and $(\sigma^2\pi^3)$ π Configurations of HI and DI.	271
GAD FISCHER AND R. NAAMAN. Vapor Phase Absorption Spectrum of 1-Aza-indolizine.	284
G. L. BLACKMAN, R. D. BROWN, F. R. BURDEN, AND A. MISHRA. Quadrupole Hyperfine Structure of the Microwave Spectrum of 1,2,4-Triazole and N-Deuterotriazole.	294
FRANÇOIS ROHART. Microwave Spectrum of Nitromethane Internal Rotation Hamiltonian in the Low Barrier Case.	301
NOTES	
STEVEN J. BORCHERT. Low-Resolution Microwave Spectroscopy: A New Band Type.	312
K. H. SCHMIDT, W. HAUSWIRTH, AND A. MÜLLER. Band Contour Analysis of Compounds with Pure Isotopes: The E Fundamentals of $HC^{35}Cl_3$.	316
FRANCOISE MARTIN, JEAN FIGUET, AND PIERRE PERDIGON. Evidence for Bands Arising from $A^1 \sum_u (v = 3)$ Level in the Spectrum of As_2 .	319
ERRATUM	321

NUMBER 3, SEPTEMBER 1975

M. GUSSONI, G. DELLEPIANE, AND S. ABBATE. The Inverse of a Rectangular Matrix: Some Applications in Molecular Dynamics.	323
J. C. DEROCHE, G. GRANER, AND A. CABANA. High-Resolution Infrared Spectrum of CH_2D_2 : The ν_3 Fundamental Band at 7 μm .	331
J. C. DECIUS. An Effective Atomic Charge Model for Infrared Intensities.	348
DAVID J. FINNIGAN, CHARLES W. GILLIES, RICHARD D. SUENRAM, E. BRIGHT WILSON, AND HASSEE KARLSSON. Microwave Determination of the Conformation and Dipole Moment of 1,3-Difluoroacetone.	363
S. D. SHARMA AND S. DORAISWAMY. Microwave Spectrum, Centrifugal Distortion Constants, and Quadrupole Coupling Constants of 3-Chloropyridine.	377

CONTENTS

J. P. BOISSY, A. VALENTIN, PH. CARDINET, M. L. CLAUDE, AND A. HENRY. Line Intensities of the ν_3 Fundamental Band of Nitrous Oxide.	391
JERRY PERRIZO, LARRY A. PUGH, AND K. NARAHARI RAO. Bands of Nitrous Oxide at 5.3 μm .	397
MICHEL BETRENCOURT, MIREILLE MORILLON-CHAPEY, CLAUDE AMIOT, AND GUY GUELACHVILI. Perturbations Study of the High-Resolution Spectrum of Methyl Bromide in the Range of the Fundamental Band ν_1 .	402
ARTHUR G. MAKI. High-Resolution Infrared Spectrum of the $\nu_1 + \nu_3$ Band of Ozone.	416
ROBERT P. LATTIMER, ROBERT L. KUCZKOWSKI, ARTHUR J. ASHE III, AND A. L. MEINZER. Electronic Structure of Arsabenzene: Microwave Spectrum, Dipole Moment, and Nuclear Quadrupole Coupling Constants.	428
VÁCLAV KRATOCHVÍL, JAROSLAV KOLC, AND JOSEF MICHL. Excited States of Dicyclohepta[<i>cd, gh</i>]Pentalene: Linear Dichroism in a Stretched Polymer, Magnetic Circular Dichroism, and Calculations.	436
D. FOSS SMITH, JR. Infrared Spectra of $^{15}\text{NCS}^-$ in the Alkali Halides.	447
I. JOBARD AND A. CHÉDIN. Critical Analysis of the Series Expansion of the Potential Energy Function of CO_2 .	464
Y. OMURA AND T. SHIMANOUCHI. Skeletal Deformation Vibrations and Rotational Isomerism of Ethylenediamine and Monoethanolamine.	480
SATOSHI SUZUKI, TSUNEO FUJII, AND TADASHI ISHIKAWA. Interpretation of Electronic Spectra by Configuration Analysis: Absorption Spectra of Mono-substituted Naphthalenes with an Electron-Accepting Group.	490
ANNOUNCEMENT	500
AUTHOR INDEX	501
SUBJECT INDEX	503

